

Long-range transport of excitons in quantum wells

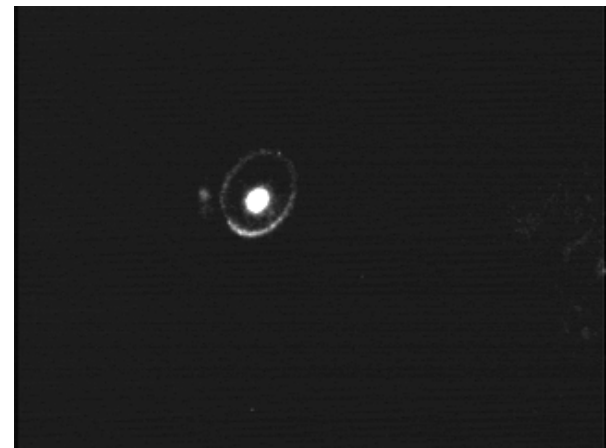
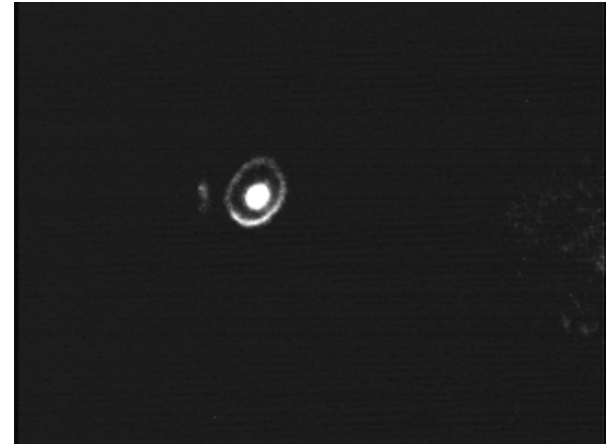
David Snoke, University of Pittsburgh, DMR-0102457

Excitons are energy particles that exist inside a semiconductor. They are created when a photon is absorbed by the material.

They normally turn back into photons within a few billionths of a second, having traveled only a few microns from the spot where they were created.

In recent experiments, however, we have observed motion of the excitons over millimeter distances. These figures show digital photographs of the excitons after they have moved hundreds of microns inside a quantum well from the central laser spot where they were created.

Long-range motion of excitons opens up the possibility of “excitonic circuits” in which signals are carried by excitons instead of electrons.



→| |←
1 mm

Undergraduate Education in Photonics

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We have created a new Certificate in Photonics program at the University of Pittsburgh, by which students in physics, chemistry, or EE take a unified curriculum in photonics taught by all three departments. At present, around 15 students are participating in the program.

As part of this program, summer research grants are supported for four undergraduate students. University of Pittsburgh REU summer students also work in photonics-related labs.

This award also supports the work of two graduate students.

